

BIO-FUELS: SEED PRESSING

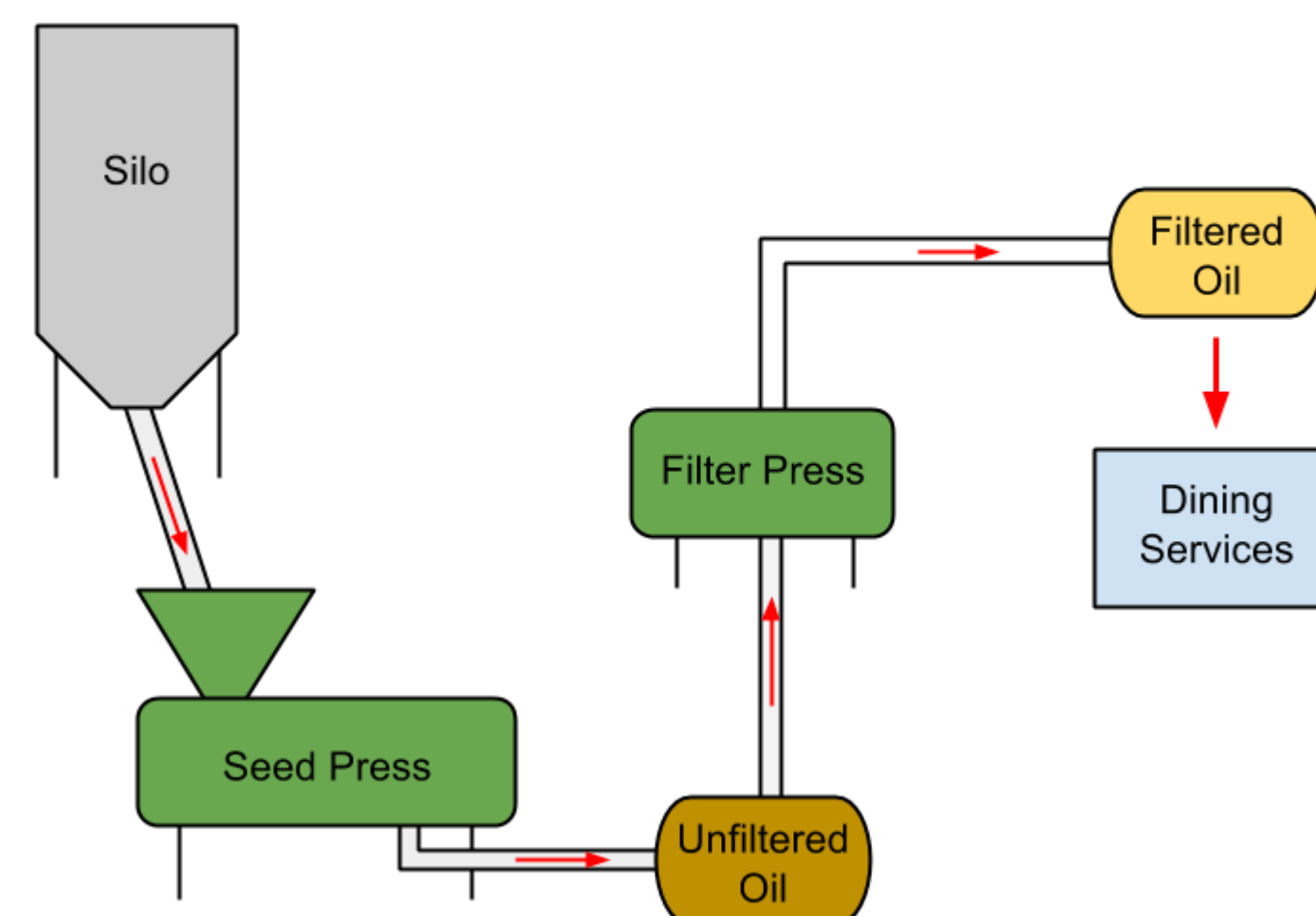
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Introduction

The Bio-Fuels: Seed Pressing Project strives to create a process that provides clean, sustainable cooking oil to several Messiah College dining locations for use in their fryers. Our project believes in a local, student-run sunflower seed pressing process that also cares for the earth. With this process, we hope to supplement a portion of the oil that Messiah College Dining Services currently purchases from a large distributor with oil we produce. In the past, this project was part of a larger initiative to create a closed loop cycle in which Dining Service's used cooking oil was converted into biodiesel and used on campus.



The Seed Pressing Process



The seed pressing facility is located in the basement of the Women's Restoration House on campus. Sunflower seeds stored in the silo beside the house flow into the seed press to be processed. The oil is stored in a holding tank while the left-over seed material (press cake) is composted. The fresh oil is then allowed to settle for 24 hours before being pumped through the filter press to remove any remaining particles.

Assessing Project Viability

Along with having a functional seed pressing process, our project needed to ensure the oil could withstand the high temperatures of the fryers, and that our project had a sustainable business model.

We compared our oil to the oil Dining Services currently uses with a smoke point test in which the oil is heated until it begins producing smoke, indicating that the oil is burning. Cooking with oil at temperatures above the smoke point gives food a burnt taste and produces unwanted smoke. We found that our oil had a smoke point lower than the operating temperature of the fryers. Refining processes could be used to potentially increase the smoke point.



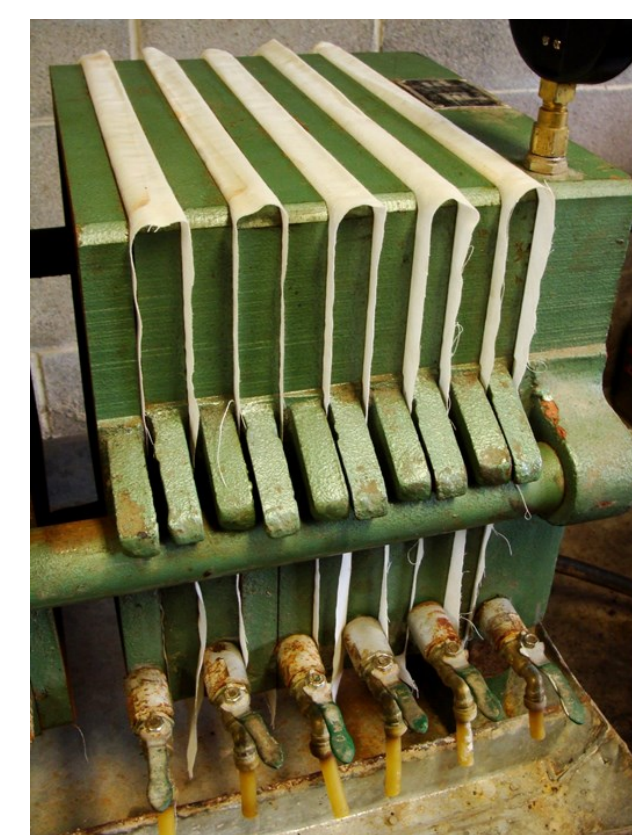
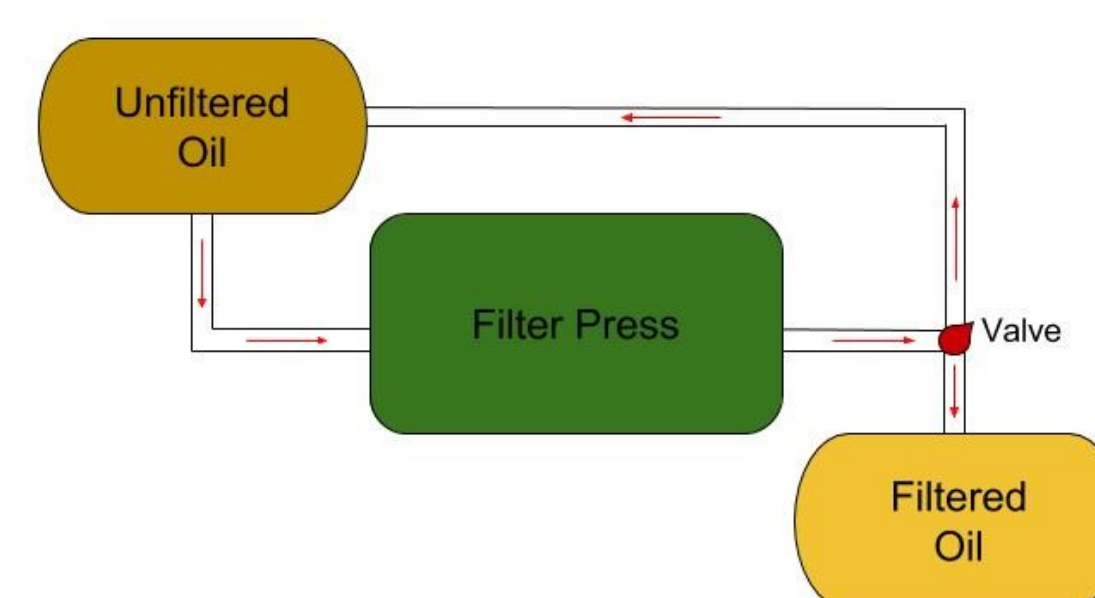
Our vision is to create a self-sustaining business run by students. In the past, our project obtained seeds for free from a local sunflower field owned by Messiah College. As circumstances changed, the field became unavailable for use in this manner. Our project has struggled to find an alternative source of low priced seed that can compete with our previous source. Due to the new cost of buying sunflower seeds, our oil would cost our client more than the current solution of buying cooking oil from commercial sources, creating an unsustainable business model.

Client



Messiah College Dining Services, *Mark Wirtz*

Oil Filtration



Filter press plates covered with filter cloth

The filter press consists of a series of plates covered with filter cloth. The oil is pumped through the layers of filter cloth to remove small particles that do not settle out. In our filtration system the dirty oil can be recirculated through the filter press multiple times before the valve is opened to redirect the oil to the clean holding tank. Any oil that leaks into the tray below the filter press is automatically recirculated to be filtered again.

Conclusions

The project has created a viable process for pressing and filtering sunflower oil, and there is hope of refining the oil to reach a high enough quality to be used by dining Services. However, work on the Bio-Fuels: Seed Pressing project has currently been paused until an economic source of sunflower seed can be found.

Further Information

If you are curious about our project and would like more information, please feel free to contact us!

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